VI. I claim:

1. A method of identifying an object, the method including the steps of:

directing a primary acoustic waveform at the object to produce a nonlinear acoustic effect by using multiple projectors driven by a synthetic spectrum;

receiving a secondary wavelet produced by the nonlinear effect; and

processing the received secondary wavelet in identifying the object.

2. The method of claim 1, wherein the step of identifying the object includes forming an image of the object.

3. The method of claim 1, wherein the step of identifying the object includes identifying a material by comparing the received secondary wavelet with a standard.

4. The method of claim 1, wherein the step of identifying the object includes forming an image and identifying a material by comparing the received secondary wavelet with a secondary wavelet produced by a nonlinear acoustic effect from air.

5. The method of claim 1, wherein the step of identifying the object includes forming an image and identifying a material by comparing the received secondary wavelet with a secondary wavelet produced by a nonlinear acoustic effect from water.

6. The method of claim 1, wherein the step of identifying the object includes forming an image and identifying a material by comparing the received secondary wavelet with a secondary wavelet produced by a nonlinear acoustic effect from land.

7. The method of claim 1, wherein the step of receiving includes receiving the secondary wavelet as scattered acoustic energy.

8. The method of claim 1, wherein the step of receiving includes receiving the secondary wavelet as backscattered acoustic energy.

9. The method of claim 1, wherein the step of receiving includes receiving the secondary wavelet as oblique scattered acoustic energy.

10. The method of claim 1, wherein the step of receiving includes receiving the secondary wavelet as forward scattered acoustic energy.

11. The method of claim 1, wherein the step of receiving includes receiving the secondary wavelet at more than one receiver, and wherein the step of processing the received secondary wavelet in identifying the object includes forming a tomographic image.

12. The method of claim 11, wherein the step of forming a tomographic image includes forming a three dimensional tomographic image.

13. The method of claim 1, wherein the step of directing includes passing the primary acoustic waveform through a wall of a container to reach the object.

14. The method of claim 1, wherein the step of directing is carried out with the primary acoustic waveform having a beam width that does not increase before the receiving.

15. The method of claim 1, wherein the step of directing is carried out with the primary acoustic waveform having a beam width that decreases before the receiving.

16. The method of claim 1, wherein the step of identifying the object includes identifying a weapon.

17. The method of claim 1, wherein the step of identifying the object includes identifying a radioactive substance.

18. The method of claim 1, wherein the step of identifying the object includes identifying an explosive.

19. The method of claim 1, wherein the step of identifying the object includes identifying a biological material.

20. The method of claim 19, wherein the biological material has a concentration of less than one in 10,000.

21. The method of claim 19, wherein the biological material has a concentration of less than one in 1,000.

22. The method of claim 19, wherein the biological material has a concentration of less than one in 100,000.

23. The method of claim 19, wherein the biological material has a concentration of less than one in 1 million.

24. The method of claim 19, wherein the biological material has a concentration of less than one in 10 million.

25. The method of claim 19, wherein the biological material has a concentration of less than one in 100 million.

26. The method of claim 19, wherein the biological material has a concentration of less than one in 1 billion.

27. The method of claim 19, wherein the biological material has a concentration of less than one in 10 billion.

28. The method of claim 19, wherein the biological material has a concentration of less than one in 10 billion.

29. The method of claim 19, wherein the biological material has a concentration of less than one in 1 trillion.

30. The method of claim 1, wherein the step of identifying the object includes identifying a chemical.

31. The method of claim 1, wherein the step of identifying the object includes identifying a drug.

32. The method of claim 1, wherein the step of identifying the object includes identifying the object one of a plurality of objects prohibited by law.

33. The method of claim 1, wherein the step of identifying the object includes identifying a land mine.

34. The method of claim 1, wherein the step of identifying the object includes identifying an underwater mine.

35. The method of claim 1, wherein the step of identifying the object includes identifying an archeological site.

36. The method of claim 1, wherein the step of identifying the object includes identifying a pipe.

37. The method of claim 1, wherein the step of identifying the object includes identifying an underground composition.

38. The method of claim 1, wherein the step of identifying the object includes identifying an indicator of a composition.

39. The method of claim 1, wherein the step of identifying the object includes identifying an indicator of a hydrocarbon.

40. The method of claim 1, wherein the step of identifying a hydrocarbon.

41. The method of claim 1, wherein the step of identifying the object includes forming a land seismographic stratification image.

42. The method of claim 1, wherein the step of identifying the object includes forming a marine water stratification image.

43. The method of claim 1, wherein the step of directing the primary acoustic waveform at the object includes directing the pulse at the object concealed in a container.

44. The method of claim 1, wherein the step of directing the primary acoustic waveform at the object includes directing the pulse at the object concealed in a piece of luggage.

45. The method of claim 1, wherein the step of directing the primary acoustic waveform at the object includes directing the pulse at the object concealed in a cargo container.

46. The method of claim 1, wherein the step of directing the primary acoustic waveform at the object includes directing the pulse at the object concealed in a motor vehicle.

47. The method of claim 46, wherein the step of directing the primary acoustic waveform at the object is carried out with the motor vehicle including a truck.

48. The method of claim 46, wherein the step of directing the primary acoustic waveform at the object is carried out with the motor vehicle including an automobile.

49. The method of claim 46, wherein the step of directing the primary acoustic waveform at the object is carried out with the motor vehicle other than a truck and other than a car.

50. The method of claim 1, wherein the step of directing the primary acoustic waveform at the object includes directing the pulse at the object concealed in a water craft.

51. The method of claim 1, wherein the step of directing the primary acoustic waveform at the object includes directing the pulse at the object concealed in an aircraft.

52. The method of claim 1, wherein the step of directing the primary acoustic waveform at the object includes directing the pulse at the object concealed in a nuclear reactor.

53. The method of claim 1, wherein the step of directing the primary acoustic waveform at the object includes directing the pulse at the object concealed on a human.

54. The method of claim 1, wherein the step of directing the primary acoustic waveform at the object includes directing the pulse at the object concealed in a human.

55. The method of claim 1, wherein the step of directing the primary acoustic waveform at the object includes directing the pulse at the object concealed in a building.

56. The method of claim 1, wherein the step of directing the primary acoustic waveform at the object includes directing the pulse at the object concealed underground.

57. The method of claim 1, wherein the step of directing the primary acoustic waveform at the object includes directing the pulse at the object concealed under water.

58. The method of claim 1, wherein the step of directing the primary acoustic waveform at the object includes directing the pulse at the object concealed in a metal container.

59. The method of claim 1, wherein the step of directing the primary acoustic waveform at the object includes directing the pulse at the object concealed in a container having a thickness of at least ¼ of an inch.

60. The method of claim 1, wherein the step of directing the primary acoustic waveform at the object includes directing the pulse at the object concealed in a container having a thickness of at least 1/8 of an inch.

61. The method of claim 1, further including the step of shaping the primary acoustic waveform into a Gausian envelope that is time differentiated with a direct current offset sufficient that none of the envelope is negative.

62. The method of claim 61, further including the step of using the envelope to amplitude modulate a sinusoidal carrier wave.

63. The method of claim 62, further including the step of gating the amplitude modulated sinusoidal carrier wave with a unitary pulse.

64. The method of claim 61, further including the steps of:

standardizing the secondary wavelet of the primary wave form by the nonlinear acoustic effect that time differentiates the envelope in a projector's far field.

65. The method of claim 64, wherein the step of processing includes discriminating a distortion of the secondary wavelet caused by the object.

66. The method of claim 65, wherein the step of processing includes characterizing the distortion in the identifying of the object.

67. The method of claim 1, wherein the step of processing includes separating elastic scattering and inelastic scattering.

68. The method of claim 1, wherein the step of receiving the secondary wavelet is carried out with a wavelet having no recognizable carrier wave.

69. The method of claim 1, wherein the step of receiving includes discerning the nonlinear effect as associated with elastic scattering.

70. The method of claim 69, wherein the step of discerning includes discerning a ratio of a nonlinear coefficient to a bulk modulus.

71. The method of claim 69, wherein the step of discerning is carried out with the ratio being a ratio of a first order nonlinear coefficient to a bulk modulus, and wherein the step of discerning also includes discerning a second ratio of a second order nonlinear coefficient to the bulk modulus.

72. The method of claim 69, wherein the step of discerning includes comparing the secondary wavelet with a wavelet standardized to air.

73. The method of claim 69, wherein the step of discerning includes comparing the secondary wavelet with a wavelet standardized to water.

74. The method of claim 69, wherein the step of discerning includes comparing the secondary wavelet with a wavelet standardized to land.

75. The method of claim 1, wherein the step of receiving includes discerning the nonlinear effect as associated with inelastic scattering.

76. The method of claim 75, further including the step of performing spectroscopic analysis of nonlinear responses excited by the secondary wavelet.

77. The method of claim 1, wherein the step of identifying includes determining the object is present.

78. The method of claim 1, wherein the step of identifying includes determining the object is not present.

79. The method of claim 1, wherein the step of directing includes directing from a hover craft.

80. The method of claim 1, wherein the step of directing includes directing from a drone.

81. The method of claim 1, wherein the step of directing includes directing from a buoy.

82. The method of claim 1, wherein the step of directing includes directing from a hand held device.

83. The method of claim 1, wherein the step of directing includes directing from a toll booth device.

84. The method of claim 1, wherein the step of directing includes directing from a passage-way device.

85. The method of claim 1, wherein the step of directing includes directing from a vertical passage-way device.

86. The method of claim 1, wherein the step of directing includes directing from a horizontal passage-way device.

87. The method of claim 1, further including the step of moving a device directing the primary acoustic waveform, with respect to the object.

88. The method of claim 1, further including the step of moving the object with respect to a device directing the primary acoustic waveform.

89. The method of claim 1, further including the step of moving both the object and a device directing the primary acoustic waveform, and adjusting for relative movement.

90. The method of claim 1, wherein the step of directing is carried out with the primary acoustic waveform having a frequency in a range of 40-80 KHz.

91. The method of claim 1, wherein the step of directing is carried out with the primary acoustic waveform having a frequency in a range of 20-40 KHz.

92. The method of claim 1, wherein the step of directing is carried out with the primary acoustic waveform having a frequency in a range of 25-30 KHz.

93. The method of claim 1, wherein the step of directing is carried out with the primary acoustic waveform having a frequency in a range of 2-4KHz .

94. The method of claim 1, wherein the step of directing is carried out with the primary acoustic waveform having a frequency in a range of 909-1,091Hz .

95. The method of claim 1, wherein the step of directing is carried out with the secondary wavelet having a frequency in a range of 2.5-7.5 Hz.

96. The method of claim 1, wherein the step of receiving is carried out with the secondary wavelet having a wavelength in a range of more than 0 to 40 kz.

97. The method of claim 1, wherein the step of receiving is carried out with the secondary wavelet having bandwidth in a range of more than 0 to 20 kz.

98. The method of claim 1, wherein the step of receiving is carried out with the secondary wavelet having bandwidth in a range of more than 0 to 2 kz.

99. The method of claim 1, wherein the step of receiving is carried out with the secondary wavelet having bandwidth in a range of more than 91 to 273 Hz.

100. The method of claim 1, wherein the step of processing includes processing the received secondary wavelet to form pixels.

101. The method of claim 1, wherein the step of processing includes processing the received secondary wavelet to form three-dimensional pixels.

102. The method of claim 101, further including the step of identifying the object in each of a plurality of the pixels.

103. The method of claim 1, further including the step of producing the primary acoustic wave form with a transducer that is not in contact with a container of the object.

104 The method of claim 1, wherein the step of directing the primary acoustic waveform is carried out with only one projector transmitting in a far field of the projector.

105 The method of claim 1, wherein the step of directing the primary acoustic waveform is carried out with a plurality of projectors transmitting in a far field of an array formed by the projectors.

106. The method of claim 1, wherein the step of directing is carried out with contiguous filters, each said filter having a unique pass band and corresponding to a projector in an array.

107. The method of claim 1, wherein the step of directing is carried out with contiguous filters, each said filter having a unique pass band and corresponding to a projector in an array, and further including the step of:

forming a focal region of coherent reconstruction of amplifying the primary acoustic waveform.

108. The method of claim 107, wherein the step of receiving includes the step of equalizing an impedance mismatch caused by a wall to a container of the object.

109. The method of claim 108, wherein the step of directing includes the step of equalizing the impedance mismatch.

110. The method of claim 109, wherein the steps of directing and receiving include adapting feedback to carry the steps of equalizing.

111. The method of claim 1, wherein the object is an element.

112. The method of claim 1, wherein the object is a molecule.

113. The method of claim 1, wherein the object is an isotope.

114. The method of any one of claims 1-113, further including the step of:

de-convoluting to overcoming an impedance discontinuity.

115. A method of identifying an object, the method including the steps of:

directing a primary acoustic waveform at the object to produce a nonlinear acoustic effect;

receiving a secondary wavelet produced by the nonlinear effect;

de-convoluting to overcoming an impedance discontinuity; and

processing the received secondary wavelet in identifying the object.

116. Apparatus for identifying an object, the apparatus comprising:

means for directing a primary acoustic waveform at the object to produce a nonlinear acoustic effect by using multiple projectors driven by a synthetic spectrum;

means for receiving a secondary wavelet produced by the nonlinear effect; and

means for processing the received secondary wavelet to produce an identification of the object.

117. The apparatus of claim 116, wherein the means for processing the received secondary wavelet to produce an identification of the object is comprised of means for forming an image of the object.

118. The apparatus of claim 116, wherein the means for processing the received secondary wavelet to produce an identification of the object is comprised of means for identifying a material by comparing the received secondary wavelet with a standard.

119. The apparatus of claim 116, wherein the means for processing the received secondary wavelet to produce an identification of the object is comprised of means for forming an image and identifying a material by comparing the received secondary wavelet with a secondary wavelet produced by a nonlinear acoustic effect from air.

120. The apparatus of claim 116, wherein the means for processing the received secondary wavelet to produce an identification of the object is comprised of means for forming an image and identifying a material by comparing the received secondary wavelet with a secondary wavelet produced by a nonlinear acoustic effect from water.

121. The apparatus of claim 116, wherein the means for processing the received secondary wavelet to produce an identification of the object is comprised of means for forming an image and identifying a material by comparing the received secondary wavelet with a secondary wavelet produced by a nonlinear acoustic effect from land.

122. The apparatus of claim 116, wherein the means for receiving is comprised of means for receiving the secondary wavelet as scattered acoustic energy.

123. The apparatus of claim 116, wherein the means for receiving is comprised of means for receiving the secondary wavelet as backscattered acoustic energy.

124. The apparatus of claim 116, wherein the means for receiving is comprised of means for receiving the secondary wavelet as oblique scattered acoustic energy.

125. The apparatus of claim 116, wherein the means for receiving is comprised of means for receiving the secondary wavelet as forward scattered acoustic energy.

126. The apparatus of claim 116, wherein the means for receiving is comprised of means for receiving the secondary wavelet at more than one receiver, and wherein the means for processing the received secondary wavelet is comprised of means for forming a tomographic image of the object.

127. The apparatus of claim 126, wherein the means for forming a tomographic image includes means for forming a three dimensional tomographic image.

128. The apparatus of claim 116, wherein the means for directing is comprised of means for passing the primary acoustic waveform through a wall of a container to reach the object.

129. The apparatus of claim 116, wherein the primary acoustic waveform havs a beam width that does not increase before the receiving.

130. The apparatus of claim 116, wherein the primary acoustic waveform has a beam width that decreases before the receiving.

131. The apparatus of claim 116, wherein the object includes a weapon.

132. The apparatus of claim 116, wherein the object includes a radioactive substance.

133. The apparatus of claim 116, wherein the object includes an explosive.

134. The apparatus of claim 116, wherein the object includes a biological material.

135. The apparatus of claim 134, wherein the biological material has a concentration of less than one in 10,000.

136. The apparatus of claim 134, wherein the biological material has a concentration of less than one in 1,000.

137. The apparatus of claim 134, wherein the biological material has a concentration of less than one in 100,000.

138. The apparatus of claim 134, wherein the biological material has a concentration of less than one in 1 million.

139. The apparatus of claim 134, wherein the biological material has a concentration of less than one in 10 million.

140. The apparatus of claim 134, wherein the biological material has a concentration of less than one in 100 million.

141. The apparatus of claim 134, wherein the biological material has a concentration of less than one in 1 billion.

142. The apparatus of claim 134, wherein the biological material has a concentration of less than one in 10 billion.

143. The apparatus of claim 134, wherein the biological material has a concentration of less than one in 10 billion.

144. The apparatus of claim 134, wherein the biological material has a concentration of less than one in 1 trillion.

145. The apparatus of claim 116, wherein the object includes a chemical.

146. The apparatus of claim 116, wherein the object includes a drug.

147. The apparatus of claim 116, wherein the object includes an prohibited by law.

148. The apparatus of claim 116, wherein the object includes a land mine.

149. The apparatus of claim 116, wherein the object includes an underwater mine.

150. The apparatus of claim 116, wherein the object includes an archeological site.

151. The apparatus of claim 116, wherein the object includes a pipe.

152. The apparatus of claim 116, wherein the object includes an underground composition.

153. The apparatus of claim 116, wherein the object includes an indicator of a composition.

154. The apparatus of claim 116, wherein the object includes an indicator of a hydrocarbon.

155. The apparatus of claim 116, wherein the object includes a hydrocarbon.

156. The apparatus of claim 116, wherein the means for processing the received secondary wavelet to produce an identification of the object is comprised of means for forming a land seismographic stratification image.

157. The apparatus of claim 116, wherein the means for processing the received secondary wavelet to produce an identification of the object is comprised of means for forming a marine water stratification image.

158. The apparatus of claim 116, wherein the means for directing the primary acoustic waveform at the object is comprised of means for directing the pulse at the object as concealed in a container.

159. The apparatus of claim 116, wherein the means for directing the primary acoustic waveform at the object is comprised of means for directing the pulse at the object as concealed in a piece of luggage.

160. The apparatus of claim 116, wherein the means for directing the primary acoustic waveform at the object is comprised of means for directing the pulse at the object as concealed in a cargo container.

161. The apparatus of claim 116, the motor vehicle is comprised of directing the pulse at the object as concealed in a motor vehicle.

162. The apparatus of claim 161, the motor vehicle is comprised of a truck.

163. The apparatus of claim 161, the motor vehicle is comprised of an automobile.

164. The apparatus of claim 161, the motor vehicle is comprised of a motor vehicle other than a truck and other than a car.

165. The apparatus of claim 116, wherein the means for directing the primary acoustic waveform at the object is comprised of means for directing the pulse at the object as concealed in a water craft.

166. The apparatus of claim 116, wherein the means for directing the primary acoustic waveform at the object is comprised of means for directing the pulse at the object as concealed in an aircraft.

167. The apparatus of claim 116, wherein the means for directing the primary acoustic waveform at the object is comprised of means for directing the pulse at the object as concealed in a nuclear reactor.

168. The apparatus of claim 116, wherein the means for directing the primary acoustic waveform at the object is comprised of means for directing the pulse at the object as concealed on a human.

169. The apparatus of claim 116, wherein the means for directing the primary acoustic waveform at the object is comprised of means for directing the pulse at the object as concealed in a human.

170. The apparatus of claim 116, wherein the means for directing the primary acoustic waveform at the object is comprised of means for directing the pulse at the object as concealed in a building.

171. The apparatus of claim 116, wherein the means for directing the primary acoustic waveform at the object is comprised of means for directing the pulse at the object as concealed underground.

172. The apparatus of claim 116, wherein the means for directing the primary acoustic waveform at the object is comprised of means for directing the pulse at the object as concealed under water.

173. The apparatus of claim 116, wherein the means for directing the primary acoustic waveform at the object is comprised of means for directing the pulse at the object as concealed in a metal container.

174. The apparatus of claim 116, wherein the means for directing the primary acoustic waveform at the object is comprised of means for directing the pulse at the object as concealed in a container having a thickness of at least ¼ of an inch.

175. The apparatus of claim 116, wherein the means for directing the primary acoustic waveform at the object is comprised of means for directing the pulse at the object as concealed in a container having a thickness of at least 1/8 of an inch.

176. The apparatus of claim 116, further including means for shaping the primary acoustic waveform into a Gausian envelope that is time differentiated with a direct current offset sufficient that none of the envelope is negative.

177. The apparatus of claim 176, wherein the means for shaping the primary acoustic waveform into a Gausian envelope is comprised of means for using the envelope to amplitude modulate a sinusoidal carrier wave.

178. The apparatus of claim 177, wherein the means for using the envelope is comprised of means for gating the amplitude modulated sinusoidal carrier wave with a unitary pulse.

179. The apparatus of claim 176, further means for standardizing the secondary wavelet of the primary wave form by the nonlinear acoustic effect that time differentiates the envelope in a projector's far field.

180. The apparatus of claim 179, wherein the means for processing is comprised of means for discriminating a distortion of the secondary wavelet caused by the object.

181. The apparatus of claim 180, wherein the means for processing is comprised of means for characterizing the distortion in producing the identification of the object.

182. The apparatus of claim 116, wherein the means for processing is comprised of means for separating elastic scattering and inelastic scattering.

183. The apparatus of claim 116, wherein the secondary wavelet has no recognizable carrier wave.

184. The apparatus of claim 116, wherein the means for receiving is comprised of means for discerning the nonlinear effect as associated with elastic scattering.

185. The apparatus of claim 184, wherein the means for discerning is comprised of means for discerning a ratio of a nonlinear coefficient to a bulk modulus.

186. The apparatus of claim 184, wherein the ratio is a first order nonlinear coefficient to a bulk modulus, and wherein the means for discerning is comprised of means for discerning a second ratio of a second order nonlinear coefficient to the bulk modulus.

187. The apparatus of claim 184, wherein the means for discerning is comprised of means for comparing the secondary wavelet with a wavelet standardized to air.

188. The apparatus of claim 184, wherein the means for discerning is comprised of means for comparing the secondary wavelet with a wavelet standardized to water.

189. The apparatus of claim 184, wherein the means for discerning is comprised of means for comparing the secondary wavelet with a wavelet standardized to land.

190. The apparatus of claim 116, wherein the means for receiving is comprised of means for discerning the nonlinear effect as associated with inelastic scattering.

191. The apparatus of claim 190, further including means for performing spectroscopic analysis of nonlinear responses excited by the secondary wavelet.

192. The apparatus of claim 116, wherein the means for processing the received secondary wavelet to produce an identification of the object includes means for determining whether the object is present.

193. The apparatus of claim 116, wherein the means for processing the received secondary wavelet to produce an identification of the object includes means for determining whether is not present.

194. The apparatus of claim 116, wherein the means for directing comprises a hover craft.

195. The apparatus of claim 116, wherein the means for directing comprises a drone.

196. The apparatus of claim 116, wherein the means for directing comprises a buoy.

197. The apparatus of claim 116, wherein the means for directing comprises a hand held device.

198. The apparatus of claim 116, wherein the means for directing comprises a toll booth device.

199. The apparatus of claim 116, wherein the means for directing comprises a passage-way device.

200. The apparatus of claim 116, wherein the means for directing comprises a vertical passage-way device.

201. The apparatus of claim 116, wherein the means for directing comprises a horizontal passage-way device.

202. The apparatus of claim 116, further including means for moving a device directing the primary acoustic waveform, with respect to the object.

203. The apparatus of claim 116, further including means for moving the object with respect to a device directing the primary acoustic waveform.

204. The apparatus of claim 116, further including means for moving both the object and a device directing the primary acoustic waveform, and adjusting for relative movement.

205. The apparatus of claim 116, wherein the primary acoustic waveform has a frequency in a range of 40-80 KHz.

206. The apparatus of claim 116, wherein the primary acoustic waveform has a frequency in a range of 20-40 KHz.

207. The apparatus of claim 116, wherein the primary acoustic waveform has a frequency in a range of 25-30 KHz.

208. The apparatus of claim 116, wherein the primary acoustic waveform has a frequency in a range of 2-4KHz.

209. The apparatus of claim 116, wherein the primary acoustic waveform has a frequency in a range of 909-1,091Hz.

210. The apparatus of claim 116, wherein the secondary wavelet has a frequency in a range of 2.5-7.5 Hz.

211. The apparatus of claim 116, wherein the secondary wavelet has a wavelength in a range of more than 0 to 40 kz.

212. The apparatus of claim 116, wherein the secondary wavelet has bandwidth in a range of more than 0 to 20 kz.

213. The apparatus of claim 116, wherein the secondary wavelet has bandwidth in a range of more than 0 to 2 kz.

214. The apparatus of claim 116, wherein the secondary wavelet has bandwidth in a range of more than 91 to 273 Hz.

215. The apparatus of claim 116, wherein the means for processing is comprised of means for processing the received secondary wavelet to form pixels..

216. The apparatus of claim 116, wherein the means for processing is comprised of means for processing the received secondary wavelet to form three-dimensional pixels.

217. The apparatus of claim 216, further including means for identifying the object in each of a plurality of the pixels.

218. The apparatus of claim 116, further including means for producing the primary acoustic wave form with a transducer that is not in contact with a container of the object.

219. The apparatus of claim 116, wherein the means for directing the primary acoustic waveform is comprised of only one projector transmitting in a far field of the projector.

220. The apparatus of claim 116, wherein the means for directing the primary acoustic waveform is comprised of a plurality of projectors transmitting in a far field of an array formed by the projectors.

221. The apparatus of claim 116, wherein the means for directing the primary acoustic waveform is comprised of contiguous filters, each said filter having a unique pass band and corresponding to a projector in an array.

222. The apparatus of claim 116, wherein the means for directing the primary acoustic waveform is comprised of contiguous filters, each said filter having a unique pass band and corresponding to a projector in an array, and further including means for forming a focal region of coherent reconstruction of amplifying the primary acoustic waveform.

223. The apparatus of claim 222, wherein the means for receiving includes means for equalizing an impedance mismatch caused by a wall to a container of the object.

224. The apparatus of claim 223, wherein the means for directing includes means for equalizing the impedance mismatch.

225. The apparatus of claim 224, wherein the means for directing and the means for receiving include means for adapting feedback to carry the equalizing.

226. The apparatus of claim 116, wherein the object is an element.

227. The apparatus of claim 116, wherein the object is a molecule.

228. The apparatus of claim 116, wherein the object is an isotope.

229. The apparatus of any one of claims 116-228, further including:
means for de-convoluting to overcoming an impedance discontinuity.

230. Apparatus for identifying an object, the apparatus including:
means for directing a primary acoustic waveform at the object to produce a nonlinear acoustic effect;
means for receiving a secondary wavelet produced by the nonlinear effect;
means for de-convoluting to overcoming an impedance discontinuity; and
means for processing the received secondary wavelet in identifying the object.

231. The apparatus of any one of claims 116-230, wherein said means for receiving is comprised of a self demodulated secondary quasi-ricker wavelet signaling computer operably in communication with a wide band adaptive equalizer, said equalizer operably in communication with a wide band low noise amplifier, said amplifier operably in communication with a wide band microphone.

232. The apparatus of any one of claims 116-230, wherein said means for directing is comprised of a primary adaptive wave modulation computer operably in communication with an n-bank of continuous band pass filters, said filters operably in communication with means for per frequency bin adaptive amplitude and phase equalization, said means for equalization operably in communication with an n-bank of focusing time delay shift registers, said n-bank of registers operably in communication with an n-bank of wavelet scattering power amplifiers, said amplifiers operably in communication with an n-bank of wave source level projectors.

233. The apparatus of any one of claims 116-230, wherein said means for processing is comprised of a synchronizer and wave form scan controller operably in communication with an acoustic raman molecular scattering spectroscopy processor, a B/A, C/A... ratio continuous wavelet transformer signal processor, an elastic / inelastic scattering image / material property discrimination logic, said logic operably in communication with a sharpened small-bulk and trace material properties / absence display.

234. The apparatus of any one of claims 116-230, wherein said means for directing is comprised of multiple projectors having a hot spot at a stand off distance.

235. The apparatus of claim 116, further comprising a means for de-convoluting comprising application logic to identify range-gated samples of barrier effects operably in communication with an adapted barrier penetration FIR filter for residual primary wavelet processing and an adapted barrier penetration FIR filter for secondary wavelet processing, said filter for residual primary wavelet processing operably in communication with an inverted FIR filter for primary waveform equalization and with a re-created Z-plane spectrum of FIR filter amplitude and phase coefficient means, said re-created Z-plane spectrum of FIR filter amplitude and phase coefficient means operably in communication with an inverted amplitude and corrugated phase coefficients means, and said adapted barrier penetration FIR filter for secondary wavelet processing oparably in communication with an inverted FIR filter for secondary wavelet processing.

236. The apparatus of claim 230, wherein said means for de-convoluting is comprised of a means for de-convoluting comprising application logic to identify range-gated samples of barrier effects operably in communication with an adapted barrier penetration FIR filter for residual primary wavelet processing and an adapted barrier penetration FIR filter for secondary wavelet processing, said filter for residual primary wavelet processing operably in communication with an inverted FIR filter for primary waveform equalization and with a re-created Z-plane spectrum of FIR filter amplitude and phase coefficient means, said re-created Z-plane spectrum of FIR filter amplitude and phase coefficient means operably in communication with an inverted amplitude and corrugated phase coefficients means, and said adapted barrier penetration FIR filter for secondary wavelet processing oparably in communication with an inverted FIR filter for secondary wavelet processing.